

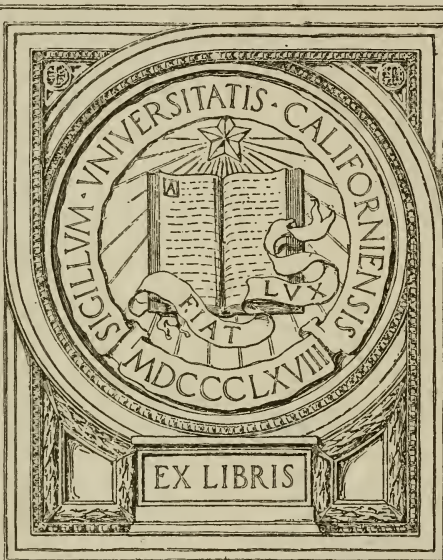
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The Making of a Book

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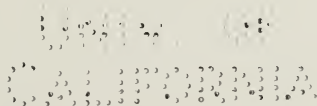
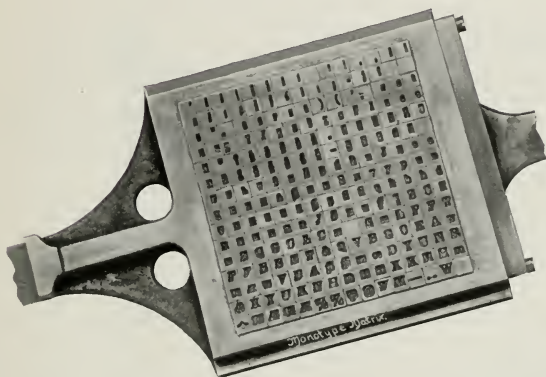


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THE MAKING OF A BOOK

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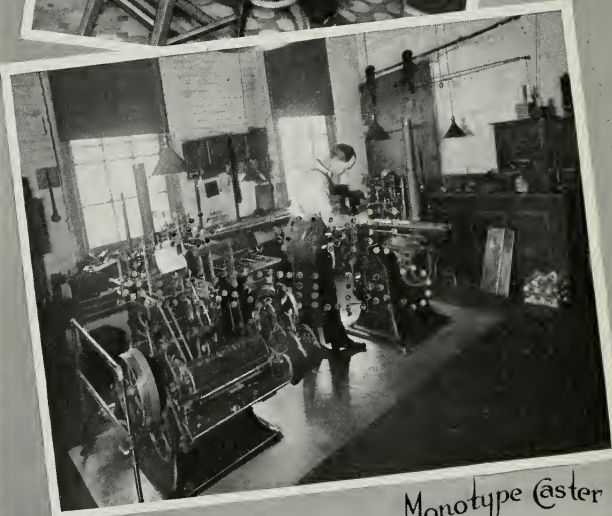
THE METHODIST BOOK CONCERN
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Monotype
Keyboard



Monotype Caster

The Making Of A Book

THE METHODIST BOOK CONCERN is the oldest publishing house in the United States. It has manufacturing plants in New York, Cincinnati, and Chicago—plants that have machinery and equipment the first cost of which amounts to \$902,741.62. The making of books is only one branch of the business of this great publishing house. The manufacture and sale of Sunday school literature is much larger than that of books. The making of books, however, should be of interest to all readers of books. The following is a brief description of how this is done.

In The Methodist Book Concern all manuscripts considered for publication are first submitted to the Book Editor for review, and he recommends certain of these for publication to the Publishing Agents, who, **The Manuscript** in consultation with the Book Editor, pass on the manuscripts that have been favorably reported. Then an order is given to the Manufacturing Department to make electrotype plates of the manuscript, and instructions as to the size type to be used, the size of printed page, the size of the trimmed book, and such other details necessary for the information of the printer and binder.



Linotype Machines



Composing Room

THE MAKING OF A BOOK

After the order has been entered in the office of the Manufacturing Department, another order is issued to the various departments having to do with the making of the book, giving explicit instructions as to every detail the department must know. The foreman of the Composing Room receives the manuscript, examines it carefully as to its being complete, and numbers all the pages seriatim. It is then given to the operator, either Linotype or Monotype, and the entire manuscript is put in type. The product of the machines is placed on galleys, and galley-proofs taken of the matter. The galley-proofs, with manuscript, or copy, are sent to the proof-reader, where the proof is read—a copyholder reading aloud from the manuscript to the reader. The galley-proofs then are passed to another reader, who reads the proofs silently. The proofs now go back to the operator to make the corrections. If the errors are numerous, a “revise” is taken of the galleys, and this “revise,” with the first proof, is sent to the proofreader so that he may see that all errors marked in the first proof have been corrected. The matter on the galleys is then made up into pages of equal length, and page-proofs sent to the proofreader. When the page-proofs have been corrected, a set of these is taken for the author or book editor, who is given an opportunity to read the manuscript in printed-page form. When these proofs are returned, the



Molding
Press



Plate Finishing

THE MAKING OF A BOOK

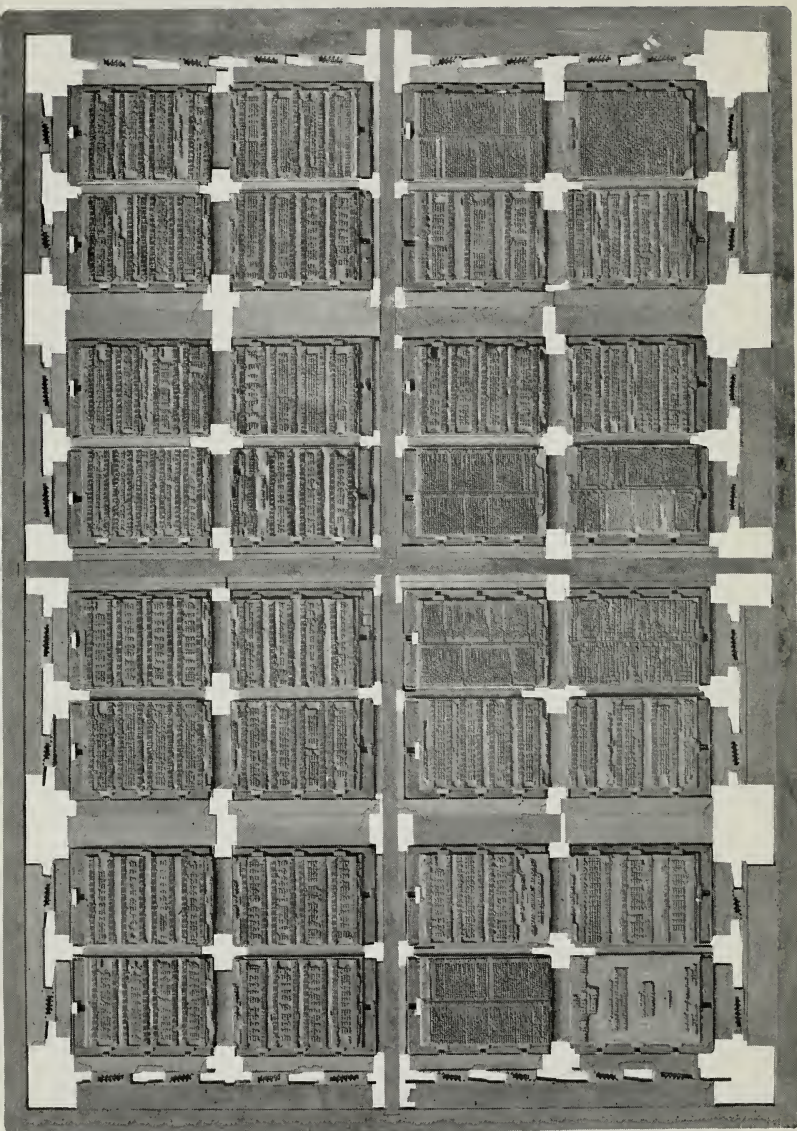
corrections and changes marked by the author are made, and a final "revise" sent to the proof-reader. Before sending the pages—locked up in forms, with guard-lines around every page—into the Electrotpe Foundry, a reserve-proof set of the forms is taken, showing just how these forms left the composing room for the electrotpe foundry.

Cases are prepared in the electrotpe foundry by pouring melted ozokerite wax on slabs, or plates, of copper. This wax is shaved to an even thickness, and covered with graphite. **Electrotpe**
An impression of the book form is now **Plate**
made by the molder in the wax case. A hydraulic press is used for this purpose. After the impression is made, the raised wax is cut down by the molder, and the mold flashed with a gas flame. The "case" is now passed to the builder, who "builds up" with wax all the places in the mold that are to be "low" in the plate, and it is then put into the black-leader, where it is polished with graphite. It is now "stopped off," or all places where there is to be no deposit of copper are painted with melted wax, as copper will only deposit where there is graphite, which is a conductor of electricity. The case is now washed with water to get all air out of the impression made. While the water is still on the case, a weak solution of sulphate of copper is poured on it, and iron filings sifted into the solution, which

the shaving machine, where the plate is shaved the "rougher," a second time, and then through an even surface. The plate now passes through may be low, and the face of the plate brought to the plate is then hammered wherever the face a rough uniform thickness. The under side of put through the "rougher," which gives the plate finishing room the cast is cut into pages, and then about three-eighths of an inch thick. In the shell is tinned, and then backed up with metal the backing room, where the under side of the moved from the wax with hot water, and sent to inch in thickness is formed. This shell is remain in the vat until a shell of about .005 of an and out of the solution on the cases, which recathodes, and deposits copper from the anodes through the anodes and the solution to the per on the cases. The electric current passes this voltage is used for plating or depositing copper on the cases. A 115 volt current goes into the generator, and this is transformed into a three to six volt current in the dynamo, and a current of used to generate the current required for the plating process. A generator-dynamo becomes the cathode. A generator-dynamo is suspended from copper rods. The case, or mold, sulphate of copper, opposite copper anodes, also is then hung from copper rods in a solution of spreads a thin film of copper over all. The case part of the case polished with graphite, and precipitates the copper in the solution on that

THE MAKING OF A BOOK

precipitates the copper in the solution on that part of the case polished with graphite, and spreads a thin film of copper over all. The case is then hung from copper rods in a solution of sulphate of copper, opposite copper anodes, also suspended from copper rods. The case, or mold, becomes the cathode. A generator-dynamo is used to generate the current required for the plating process. A 115 volt current goes into the generator, and this is transformed into a three to six volt current in the dynamo, and a current of this voltage is used for plating or depositing copper on the cases. The electric current passes through the anodes and the solution to the cathodes, and deposits copper from the anodes and out of the solution on the cases, which remain in the vat until a shell of about .005 of an inch in thickness is formed. This shell is removed from the wax with hot water, and sent to the backing room, where the under side of the shell is tinned, and then backed up with metal about three-eighths of an inch thick. In the finishing room the cast is cut into pages, and then put through the "rougher," which gives the plate a rough uniform thickness. The under side of the plate is then hammered wherever the face may be low, and the face of the plate brought to an even surface. The plate now passes through the "rougher" a second time, and then through the shaving machine, where the plate is shaved



THE MAKING OF A BOOK

to the thickness required for printing—less than one-sixth of an inch thick. The guard lines are now removed, and the plate beveled so that it can be clamped to a patent block.

When the plates for a book are ready for the press, the make-up man provides a form of patent blocks on which the plates are to be clamped when on the press. This form will contain

The Form

sixteen, thirty-two, or sixty-four patent blocks, governed by the size of the sheet of paper or the size of the book to be printed. After one form has been printed, the plates are removed from the blocks, on the press, and others put in their places, and so on until the presswork of the entire book is completed.

The make-ready on the press requires some time. The first impression made, at times, is hardly readable. One would think that, with the care exercised in the electrotpe foundry, hardly any make-ready would be

Make-Ready

necessary; but such is not the case. The pressman takes an impression of the form, and such portions of the plates as are low in this impression are then underlaid. Another impression is now taken of the form, and an overlay prepared. The pressman holds the reverse side of the sheet to a strong light, and marks a number of circles to indicate to his assistant the thicknesses of tissue paper required to bring the impression up evenly. The assistant pastes on these tissues, and the



Job Press Room



Flat Bed press

THE MAKING OF A BOOK

overlay is then hung on the cylinder of the press exactly over the pages of the form. With this in position, another impression of the form is made and submitted to the foreman for approval. If the make-ready is all right, the press is ready to run. If not, a spot-sheet is prepared to bring up any defects that are apparent in the proof. A sheet of paper is printed on one side first, then turned and printed on the other side. The pressman folds this sheet, printed on both sides, to make sure that the plates are laid right and that the register is perfect.

Most books are printed on paper that will “work and turn,” or, in other words, one side is printed on a given number of sheets of paper and then the other side printed from **Paper** the same form. The pages are so laid that if page one should be to the extreme left of the form, page two, which backs page one in the printed book, will be on the extreme right of the form. All forms are imposed for certain folding machines, some of these folding the sheet at right angles and others in parallel folds.

The printing press is a wonderful piece of machinery. It must be rigid to make an even impression. The form and the cylinder must measure exactly the same. Should the **The Printing Press** cylinder be smaller or larger, this will show after a few impressions by the wear on the form. The ink flow can be controlled by thumb-

109 Lead Right Light

110 I am Trusting Thee, Lord Jesus

111 I am Trusting Thee, Lord Jesus

112 I am Trusting Thee, Lord Jesus

113 He Leadeth me, O Blest Thought

114 Lord for Tomorrow and Its Needs

115 God Will Take Care of You

116 I have Sinned, Plead Mercy

117 Lead me from Sin and Miss

118 O Lord be Kind, and I will sing Praise

119 How the very Thought of Thee

120 How Lowly are We, O Lord

121 Healed was the Evening Horn

122 O Lord be Kind, and I will sing Praise

123 I am Trusting Thee, Lord Jesus

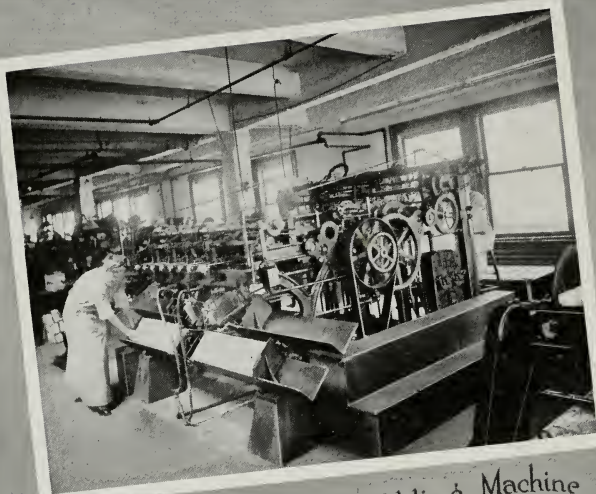
124 Father, Lead me Out of This

THE MAKING OF A BOOK

screws set against a "knife," or blade of steel, and also by a ratchet controlling the distance the fountain roller is to turn. For cuts a special overlay is prepared. A mechanical overlay is now used instead of the hand-cut overlay of years ago. The blacks or lights of a cut are controlled by the impression. The greater the pressure at a given point, the darker or blacker that point will appear, although the light and dark places are covered with exactly the same amount of ink.

The paper used in the printing of a book will have its effect in the result of the presswork. While type will print on a rough-surfaced paper, satisfactory results in the printing of cuts cannot be obtained on such a paper. All half-tone cuts should be printed on a paper having a smooth surface. The sheets printed on the flat-bed press, if turned on the press, are also cut on the press. There is a slit on the press that cuts the sheet in two as the second side is printed. The printed sheets, when the ink is dry, are sent to the Bindery, where they are folded.

Having received the flat sheets, printed on both sides, from the Press Room, the first operation in the binding of a book is the folding of the sheets into signatures, or sections. If the book is printed on heavy paper, the **Folding** book has been so made up as to fold in sixteen-page sections; if printed on a lightweight or India paper, the printing has been so arranged that the



Folding Machine



Bundling Machine

THE MAKING OF A BOOK

sheets will fold in thirty-two-page signatures. Practically all the folding is now done by the aid of folding machines. These are built to fold sheets as small as two and one-half inches wide and three and three-quarters inches high up to a sheet the size of a large Bible with a width of twelve or fourteen inches and a height of sixteen to twenty inches. Some machines are called 'double sixteens, and will fold the sheet and deliver it in two receptacles, sixteen-page sections in each. A larger machine is called a quadruple folder, and will deliver four sixteen-page or two thirty-two-page signatures, or sections, in each revolution.

If the book is illustrated, the illustrations, as a rule, are printed separately on coated paper, and are pasted in the section as indicated by the list of illustrations. All these sections are taken from the folding machines to the pasting department, where the operators "fan out" the single illustrations so that they are separated about one-eighth of an inch. This width has a thin coating of paste applied and is then placed on the sheet, where it will adhere very firmly in a few hours. All books have a four-page end of waste paper attached to the first and last section of the book; these are attached in much the same manner as are the illustrations.

Tipping

The different sections, perfect in themselves, are now ready to be assembled into a perfected



Tipping & Gathering



Sewing Books

THE MAKING OF A BOOK

book. This operation is called gathering and collating. The average book runs from three hundred and twenty to five hundred pages. A porter brings the different sections, in the shape of bundles of five hundred signatures each, to the gathering table, untying and placing them on a table, and arranging them in what is known as a lay-out. Thus the first pile consists of section pages one to sixteen; the second, seventeen to thirty-two; the third, thirty-three to forty-eight, and so on to the last pile. The gatherer starts at the first section and lifts one signature from that pile, and so on to the last pile, reversing the operation, starting with the last signature back to signature one, and so on, backward and forward, until the entire layout has been gathered. **Gathering**

The next operation is that of sewing. This is performed by a very ingenious machine known as a Smythe sewer, consisting of four revolving arms on a shaft which swing around at a rate of from forty to seventy movements per minute. The operator merely finds the center of the section of the book and hangs it to the revolving arms, which then engage with other mechanism in the head of the machine and make a perfect lockstitch with from one to five curved needles, as may be required by the size for the sewing of the book. **Sewing**

The sewed books are taken to a book-trimmer,



Duplex Trimmer



Gilding

THE MAKING OF A BOOK

or cutting machine, where they are clamped in the machine in piles about six inches high, and the heads, sides, and foot of the books are trimmed by descending knives with a shear motion. The books are now perfectly flat and square on the back, front, head, and foot. **Trimming**

If the books are to have their edges gilded, they are taken from the cutting table to the gilding room. Here they are tightly clamped in rows in a press resting on a wood table, with a box underneath. When the books have been tightly compressed between the ends, or cheeks, of the press, the operator sandpapers the edges very smoothly and supplements this by scraping the edges with a disk of steel with sharp edges. A coating of diluted albumen is applied, and while still damp sheets of gold-leaf are laid on until the edges of the books on the top of press are covered. He then takes a wooden handle with a flat agate burnisher fastened in the end, and rubs it very forcibly over the edges with a piece of linen paper under the burnisher. The gold-leaf now adheres to the edges, but is very dull. To brighten the gold, he takes another burnisher and rubs over the gold-leaf on the surface of the books, but without using the linen paper. The books are now ready to be taken out of the press with one end gilded. If the book is to have full-gilt edges, the above described operation has to be repeated three times. **Gilding**



Glueing Up



Rounding
& Backing

THE MAKING OF A BOOK

The books are now all turned one way, with their backs toward the workman, who applies a coat of hot flexible glue to the back. After the glue has set, the books are ready for the rounding and backing machine. A pair of rollers works in front of a flat feed-table, the lower one merely revolving on its axis, while the upper roller rises and falls uniformly at a rate of about eleven times a minute. The book is placed in the machine, and as the rollers revolve, they force the book to become convex in the back and concave in the front. When the book has passed through the rollers, and before it is released, a pair of beveled jaws clamp the book about one-eighth of an inch from the back, a heavy concave steel rolls back and forth over the back of the book and forces the first and last sections over beveled clamps, forming a joint from the flat of the book, against which the covers rest.

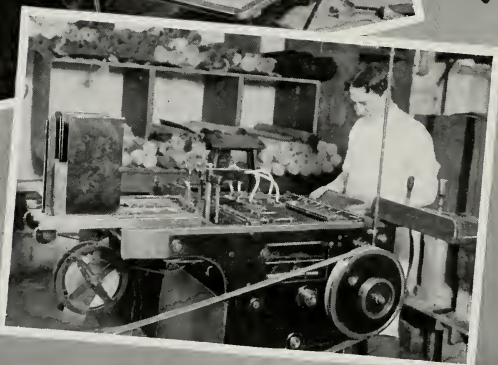
To strengthen the book, the back is glued with flexible glue and a piece of supers, or cheese cloth, extending about three-quarters of an inch over the side, is attached, and a head and tail piece, known as a headband, at the top and foot. The headband is made of calico, silesia, silk, or any other kind of woven fabric. The back of the book then receives another coating of flexible glue over the cheese cloth, and a piece of strong manila paper the width of the back of the book from joint to joint, but a little

Cutting
Boards



Cloth
Cutter

Book
Cover
Making
Machine



THE MAKING OF A BOOK

shorter than the length of the book, is fastened over the cheese cloth with paste. The book is now ready for a cover or case.

The first operation in making a case, or book cover, is to cut the boards to the size required for the book. This is done on a machine having a series of round, beveled knives on two revolving shafts. The cloth, coming in rolls from thirty-six to forty inches wide and from thirty-six to seventy-two yards long, is then cut on an ingenious machine, where slitters cut the cloth lengthwise and a straight knife, with a shear motion, cuts the cloth at right angles to the revolving knives. The cloth is now clamped and the corners sheared off diagonally. The case-making machine being adjusted properly, the cloth is placed to the left of the operator, and the boards in two hoppers. The operator then places the cloth on the top of a revolving brass cylinder, small fingers holding it fast. The cylinder, revolving, brings the cloth in contact with another cylinder revolving in a trough of glue, thus applying glue to the reverse side of the cloth. The cloth is now removed mechanically, glued side up, from the cylinder to a platform, and the binder's boards placed on the cloth by rubber-suction devices; a paper back-lining has also been cut from a roll and placed between the boards on the cloth. Two steel bars now force the ends of the cloth over and on the boards, at the same time making

**Case
Making**



Gold Leaf
Laying



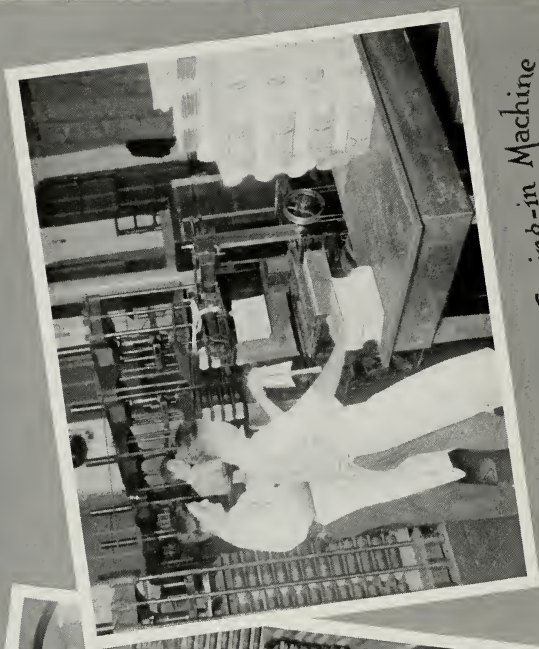
Embossing &
Stamping

THE MAKING OF A BOOK

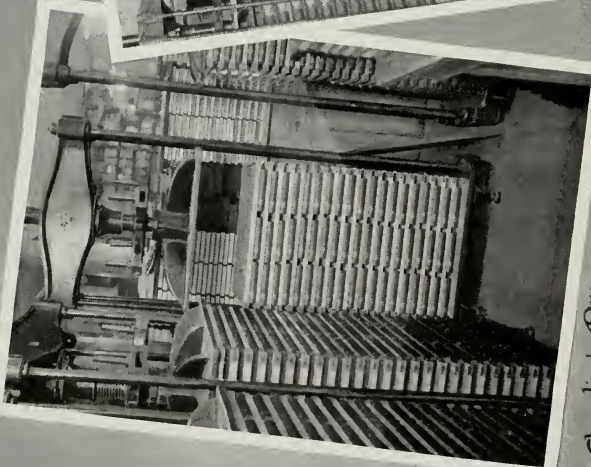
a tuck in the cloth; then another pair of folding bars repeat the turning-in operation, and the case is drawn on the top of a flat rubber-bag, a flat steel top descending and pressing the boards and glued cloth firmly together. The finished case is then drawn out by rollers and deposited on a platform.

Before fastening the book into the cover it is necessary to stamp the title on the cover. This is done either with liquid ink, leaf-ink, or gold-leaf. If ink is used, the process is similar to **Inking and Stamping** that of printing on paper. If gold is used, the brass die of the lettering or ornamentation is fastened to the top of a stamping press, the top being heated. The surface of the cloth receives a very much diluted coating of albumen. When this is thoroughly dry, the cloth is rubbed with a piece of canton flannel containing olive oil, the gold-leaf laid on that portion of the cover to be ornamented, and the cover then fed into the stamping press, where it is pressed against the die in the heated head. Wherever the hot die touches the gold-leaf will adhere firmly; and the surplus gold-leaf is rubbed off and carefully saved.

We now have book and cover ready to be joined together. This operation is now performed by the aid of machinery. The principal parts of the machine now generally used are a maga- **Casing-in Machine** zine for holding the case, three revolving and ascending and descending arms, and two paste rollers revolving in a trough of paste. One



Case-in Machine



Standing Presses

THE MAKING OF A BOOK

of the operators takes one of a pile of books, opens it at about its center, and hangs it on one of the revolving arms. The machine makes a third of a revolution, and he hangs another book similarly on the second arm. In the meantime the arm has ascended and the pasting rollers have been pressed against the book; by an ingenious motion the back, or joint, of the book received a double quantity of paste. The arm then begins to rise, and the paste is applied to the two sides of the book, front and back; but just before the book begins to rise with the arm, a finished case has been pushed forward from the magazine and rests with its center directly over the back of the book; and as the arm rises the front and back of the case are pressed to the side of the book by means of two clamping rods. Another operator now takes the pasted book, with the case loosely attached, and places it in a standing press, consisting of six rods with a stationary bed and movable top with screw. A smooth hardwood board, bound with a strip of brass or aluminum and extending about one-eighth of an inch all around on both sides of the board beyond the flat of the board, is used, and the books placed on the board around the four sides, the joint of the book resting on the thin strip of metal. This operation is repeated until the entire press is built up, or filled. The operator then screws down the top of the press with the aid of a long iron bar until all the



Inspecting
and
Wrapping

THE MAKING OF A BOOK

boards, with the books, are tightly clamped. After they have been clamped for from six to twelve hours, the press is unscrewed and the books taken out and placed on the examining and wrapping table.

The first thing which the examiner does is to see that the first and last leaf have been properly pasted. Then the title page is examined, to see that the book has been properly cased in its cover. Finally, the paper jacket, or wrapper, is adjusted, and the books are then piled in small enclosed hand-wagons and sent to the Sales Department, ready for shipping.

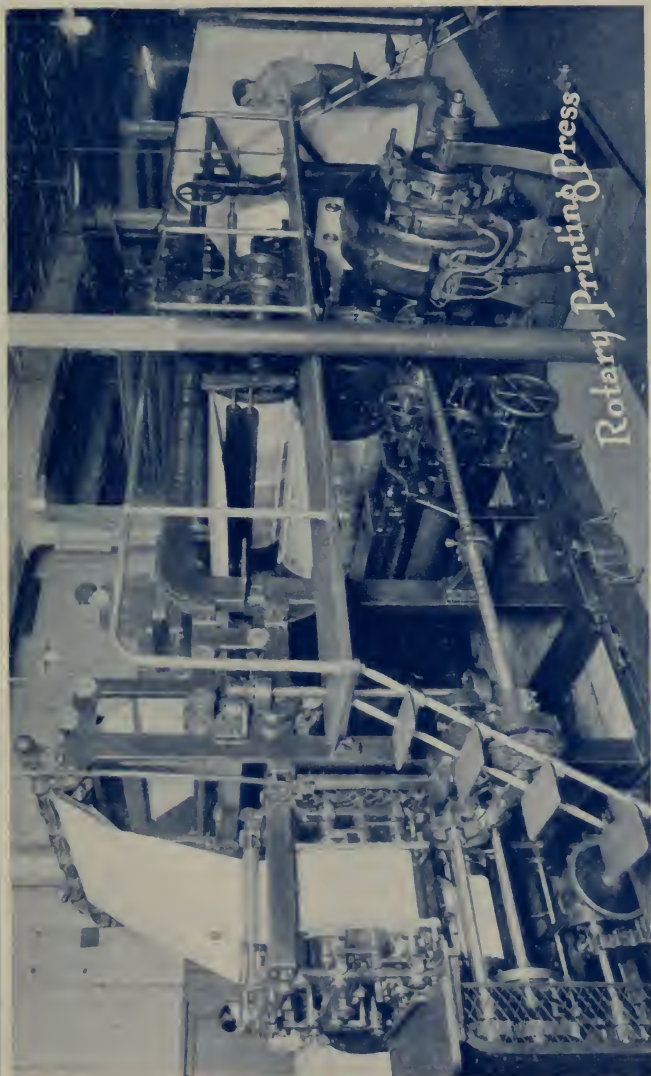
The binding of a gilt-edge circuit or Oxford style of Bible is a branch of the binding business almost entirely distinct from the ordinary binding. Almost all the work of the binding of a Bible is done by hand, without the aid of machinery. Up to the stage of cutting, the binding is very similar; but after that it varies. Most of the Bibles are round-cornered, and have full-gilded, red-under-gold edges. The leather covers are also made by the most skilled mechanics, as all kinds of leather and other material are used for the covers. In leather, sheepskin, goatskin, cowhide, sealskin, and, in fact, most all kinds of leather made are used. The sheepskin, calfskin, silk-cloth, and waterproof colored paper are used for lining the inside of the cover. The leather for the cover, after being cut from the

**Examining
Wrapping**

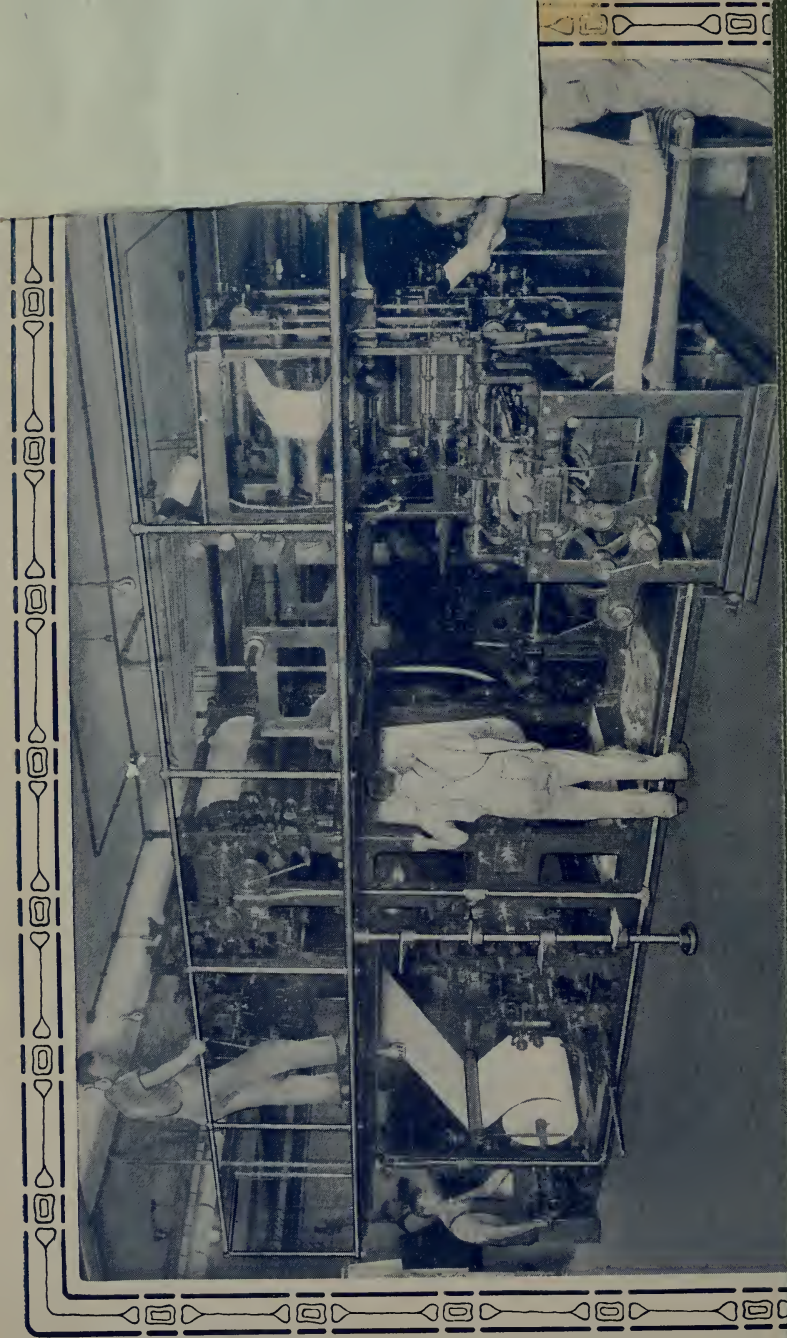
**Bible
Binding**

THE MAKING OF A BOOK

skin, has the edges skivered or pared. Then the edges are treated to a coat of paste, and, after they have lain in this state for a time, to allow the paste to penetrate, the workman is ready to make the case. The best Bibles have no lining or stiffener of any kind on the inside—the leather is turned in on itself. To do this, two pieces of zinc, which, combined, are the exact size of the cover, are laid on the pasted leather and edges butted together. The pasted edges of the leather are then turned in over the edges of the zinc and the round corners carefully worked out smoothly with a bone folder. After the leather is properly turned in, the cover is made of the right size, but with the zinc on the inside. The operator next dips his folder in water and loosens and slightly raises the pasted edge or turn-in, and withdraws the zinc. Then with the ball of his hand he hammers down the pasted edge, completely turning in the leather cover of the right size. The stamping of the gold lettering is similar to the method used in the cloth cover. The casing-in is all done by hand. The backs of the Bibles, after being rounded, are glued and attached to the back only. After the glue has set the sides of the book are pasted and pressed between smooth boards lined with canton flannel, and when thoroughly dry are sent to the examining and wrapping table for a very critical examination before being wrapped, boxed, and sent to the Sales Department.



Rotary Printing Press



Gaylord Bros.
Makers
Syracuse, N. Y.
PAT. JAN. 21, 1908

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Mathematics

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